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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/718,936	11/20/2003	Jeffrey Douglas Brown	AUS920030612US1	3162

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EXAMINER	
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ART UNIT	PAPER NUMBER
2416	

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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/718,936	BROWN ET AL.	
	Examiner	Art Unit	
	REDENTOR M. PASIA	2416	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☐ Responsive to communication(s) filed on *11 July 2008*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-14,16,17,19-21 and 24-27* is/are pending in the application.

4a) Of the above claim(s) *1-6 and 10-14* is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *7-9,16,17,19-21 and 24-27* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date *02/19/2009*.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Response to Amendment

1. Applicant's amendment filed on 02/19/2009 has been entered. Claims 7-9, 16-17, and 19-21 have been amended. Claims 15, 18 and 22-23 have been cancelled. Claims 24-27 are newly added claims. Claims 7-9, 16-17, 19-21, 24-27 are still pending in this application, with claim 27, and 51, being independent.

Response to Arguments

- **35 USC 112 Rejections of claim 9 and 19**

Applicant's arguments with respect to claims 9 and 19 under 35 USC 112 2nd paragraph have been considered but are moot in view of the new ground(s) of rejection.

However, new grounds of rejection arose from the amendments applied to claim 9. Details are provided in the rejections below.

- **35 USC 101 Rejection of claims 9 and 19**

Applicant's arguments filed 02/19/2009 have been fully considered but they are not persuasive.

Applicant's Attorney amended claims 9 and 19 to include "...a computer program product embodied on a tangible computer readable medium..."

The original disclosure **does not** show the claim limitation "...a computer program product embodied on a tangible computer readable medium..." Thus, one of ordinary skill in the art can

be reasonable to interpret this claim limitation as fairly conveying signals and other forms of propagation or transmission media to one of ordinary skill in the art. By having so, the Examiner has given the broadest reasonable interpretation to this claim limitation.

- **35 USC 102 and 103 rejections**

Applicant's arguments with respect to claims 7-9, 16-17, 19-21, 24-27 have been considered but are moot in view of the new ground(s) of rejection.

Specification

2. The amendment filed 02/19/2009 is objected to under 35 U.S.C. 132(a) because it introduces new matter into the disclosure. 35 U.S.C. 132(a) states that no amendment shall introduce new matter into the disclosure of the invention. The added material which is not supported by the original disclosure is as follows:

The specification was amended at Par. 0014 to include the new matter, "a computer program product embodied on a tangible computer readable medium." Even though, the original disclosure shows "a computer program product embodied on a medium with a computer program embodied thereon…" in claim 9 (submitted claims dated 11/20/2003), the original disclosure **does not show** "a computer program product embodied on a tangible computer readable medium."

Applicant is required to cancel the new matter in the reply to this Office Action.

Claim Rejections - 35 USC § 112

3. The following is a quotation of the first paragraph of 35 U.S.C. 112:

> The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

4. **Claims 9, 19, 24 and 27** are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the written description requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention.

Independent claim 9 shows the claim limitation "the computer program product embodied on a tangible computer readable medium." This mentioned claim limitation is not present in the original disclosure. Even though, the original disclosure shows "a computer program product embodied on a medium with a computer program embodied thereon…" in claim 9 (submitted claims dated 11/20/2003), the original disclosure **does not show** "a computer program product embodied on a tangible computer readable medium."

Dependent claims 19, 24 and 27 are rejected based on the same reasoning applied to independent claim 9.

Claim Rejections - 35 USC § 101

5. 35 U.S.C. 101 reads as follows:

> Whoever invents or discovers any new and useful process, machine, manufacture, or composition of matter, or any new and useful improvement thereof, may obtain a patent therefor, subject to the conditions and requirements of this title.

6. **Claims 9, 19, 24 and 27** are rejected under 35 U.S.C. 101 because the claimed invention lacks patentable utility.

Independent claim 9 shows the claim limitation "the computer program product embodied on a tangible computer readable medium." The language presented in claim 9 does not show the mentioned claim limitation as being operated by a computer, processor or any equivalent. Thus, one can see that the mentioned claim limitation is a mere computer program stored on computer readable medium since there is no computer/processor utilizing the computer program. With this reasoning, having a computer program stored in a medium alone does not provide utility unless the program is operated on by the computer/processor.

Dependent claims 19, 24 and 27 are also rejected since the claims share the claim limitation present in independent claim 9.

7. **Claims 9, 19, 24 and 27** are rejected under 35 U.S.C. 101 because the claimed invention is directed to non-statutory subject matter.

Independent claim 9 shows the claim limitation "the computer program product embodied on a tangible computer readable medium." Even though, the original disclosure shows "a computer program product embodied on a medium with a computer program embodied thereon…" in claim 9 (submitted claims dated 11/20/2003), the original disclosure **does not show** "a computer program product embodied on a tangible computer readable medium."

Thus, one of ordinary skill in the art can be reasonable to interpret this claim limitation as fairly conveying signals and other forms of propagation or transmission media to one of ordinary skill in the art.

Dependent claims 19, 24 and 27 are also rejected since the claims share the claim limitation present in independent claim 9.

Claim Rejections - 35 USC § 103

8. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

9. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

10. **Claims 7-9, 17, 20-21 and 24** are rejected under 35 U.S.C. 103(a) as being unpatentable over Hegde et al. (US 6,810,031; hereinafter Hegde) in view of Zheng et al. (US 2002/0163886; hereinafter Zheng).

As to claim 7, Hegde shows shaper apparatus (Figure 2-3; line card 102/Internet Protocol Engine (IPE) card 104 performs traffic shaping) for multiplex communication path access control (Figure 1, bandwidth contention along switch fabric) comprising:

a processing unit (Figure 3, Protocol Processing Units (PPUs) 106 of IPE card 104) configured to request an amount of path bandwidth to be reserved (col. 8, lines 6-19 and 28-53; PPUs 106 gather bandwidth request information; note IPE card 104 has a bandwidth request for transmission across switch fabric; see Figure 10-11, start request generation) for use by a first entity (Figure 3, IPE card 104);

an operating system (col. 13, lines 42-61; bandwidth distribution software module) configured to:

determine whether the amount of path bandwidth is available to be reserved (Figures 10-11, method shows determination if bandwidth is available; available BW > 0; total req. > avail. BW);

reserve the amount of path bandwidth for use by the first entity (col. 8, lines 6-19 and 28-53; PPUs 106 gather bandwidth request information; note IPE card 104 has a bandwidth request for transmission across switch fabric) as a number of credits (col. 9, lines 19-26; bandwidth request information includes buffer occupancy parameter; col. 6, lines 41-53; buffer occupancy parameter includes counter value based on grants/credits; see Figures 10-11, method utilizing grants/credits) over an operational period (col. 6, lines 29-67; note bandwidth requirement is calculated for each cycle (C).);

assign a unique identity to the first entity (col. 6, line 30-32; CardID parameter uniquely identifies a line card 102 or IPE card 104); and

notify the first entity of the unique identity and the reservation of bandwidth (Figure 4, shows format of BW request information; col. 8, lines 28-52; note control information transmitted by PPUs include CardID and bandwidth request information);

notify a load shaper (Figure 2-3, Master Protocol Processing Unit (MPPU) 108; note MPPU 108 performs traffic shaping through the use of credit/grant procedures in the overall system.) of the unique identity (Figure 4; col. 8, lines 28-52; note control information transmitted by PPUs include CardID and bandwidth request information are gathered by MPPU 108);

notify the load shaper of the reservation of bandwidth by informing the load shaper (Figure 4; col. 8, lines 28-52; note control information transmitted by PPUs include CardID and bandwidth request information are gathered by MPPU 108) of the number of credits over the operational period reserved for use by the first entity (Figure 10-11; col. 9, lines 19-26; bandwidth request information includes buffer occupancy parameter; col. 6, lines 41-53; buffer occupancy parameter includes counter value based on grants/credits; see Figures 10-11, method utilizing grants/credits; col. 6, lines 29-67; note bandwidth requirement is calculated for each cycle (C).); and

wherein the load shaper is configured to:

reset a counter to the number of credits at the beginning of a time frame (col. 7, lines 43-65; note Bandwidth Distribution Protocol (BWDP) provides credits to PPUs and MPPUs; note credits are reset to a default value if not data traffic is provided for a certain IPE card fro a certain defined Credit Regeneration Duration),

wherein the time frame has a length equal to the operational period (col. 6, lines 28-58; note each cycle C consists of time required to transmit a determined number of bytes; claim 31 shows cycle time have a determined duration);

receive a path use request (Figure 4; col. 8, lines 28-52; note control information transmitted by PPUs include CardID and bandwidth request information are gathered by MPPU 108; see Figures 10-12 regarding receiving requests) from the first entity (col. 9, line 6-18; note bandwidth request was requested by IPE 104), the path use request comprising the unique identity (col. 9, lines 28-37; control information includes the CardID);

if the counter has at least one credit remaining, decrement the counter (Figure 10-11; Grant [n] = Request [n] Avail BW = Avail BW – Total Req; col. 7, line 66 to col. 8, lines 5; note that When the PPU 106 of the IPE card 104 or the MPPU 108 of the line card 102 schedules traffic to a line card 102 or IPE card 104, it is allowed to transmit an extra amount of traffic to a card (draw-down), which must be less than or equal to the Credit for that particular card. In such a case the Credit will be correspondingly decreased (i.e., the counter will be decremented.).).

Hegde shows the use of grants/credits in performing the Bandwidth Distribution Protocol between line cards and IPE cards, Hegde does not specifically show the relationship between actual transmission of a bandwidth request when a counter has credits remaining. Even though, Hegde shows a counter having at least one credit remaining as discussed above, Hegde does not specifically show enqueueing the path use request for transmission on a multiplex communication path (when counter has credit(s) remaining).

However, the above-mentioned claim limitations are well-established in the art as evidenced by Zheng. Zheng shows (abstract) a counter signal is generated to indicate the beginning of timeslots in a measurement window. The number of timeslots needed to transmit

the data packets with a selected data rate is determined. The method further accesses data from at least one table to determine the spacing between timeslots in the measurement window used to request access to a data bus based on the number of timeslots needed to achieve the selected data rate. Further, access to a data bus for the data packets in the buffer is requested based on the data accessed from the table. The method further transmits the packets when access to the bus is granted..

Specifically, Zheng shows enqueueing the path use request for transmission on a multiplex communication path when counter has credit(s) remaining (Figures 3-4; Par. 0029, 0031, 0033; Traffic shaper 400 includes request generator 402 and counter 404. Counter 404 receives a clock signal from bus 406 and provides an input signal to request generator 402. Request generator 402 further provides request signals to bus 406 and receives grant signals from bus 406. When a request is granted, a data packet from buffer 308 is placed on the bus. Once the request is granted, counter 410 is decremented. The request is granted either because no one is sending data, the timeslot is available or the timeslot was granted to this source based on arbitration.).

In view of the above, having the system of Hegde, then given the well-established teaching of Zheng, it would have been obvious to one of ordinary skill in the art to modify the system of Hegde as taught by Zheng, in order to allow an approximation algorithm that takes advantage of the repetitive nature of requests produced by request generators which substantially reduces the size of the memory needed to store a request sequence for a given measurement window of a given size (Par. 0034).

As to claim 8, Hegde shows a method (abstract shows a method of bandwidth distribution) of managing multiplex communication path access control (Figure 1, bandwidth contention along switch fabric) in a computer system (Figure 1, system 100), comprising:

requesting, by a processing unit (Figure 3, Protocol Processing Units (PPUs) 106 of IPE card 104), an amount of path bandwidth to be reserved (col. 8, lines 6-19 and 28-53; PPUs 106 gather bandwidth request information; note IPE card 104 has a bandwidth request for transmission across switch fabric; see Figure 10-11, start request generation) for use by a first entity (Figure 3, IPE card 104);

determining, by an operating system (col. 13, lines 42-61; bandwidth distribution software module), whether the amount of path bandwidth is available to be reserved (Figures 10-11, method shows determination if bandwidth is available; available BW > 0; total req. > avail. BW);

reserving, by the operating system, the amount of path bandwidth for use by the first entity (col. 8, lines 6-19 and 28-53; PPUs 106 gather bandwidth request information; note IPE card 104 has a bandwidth request for transmission across switch fabric) as a number of credits (col. 9, lines 19-26; bandwidth request information includes buffer occupancy parameter; col. 6, lines 41-53; buffer occupancy parameter includes counter value based on grants/credits; see Figures 10-11, method utilizing grants/credits) over an operational period (col. 6, lines 29-67; note bandwidth requirement is calculated for each cycle (C).);

assigning, by the operating system, a unique identity to the first entity (col. 6, line 30-32; CardID parameter uniquely identifies a line card 102 or IPE card 104);

notifying, by the operating system, the first entity of the unique identity and the reservation of bandwidth (Figure 4, shows format of BW request information; col. 8, lines 28-52; note control information transmitted by PPUs include CardID and bandwidth request information);

notifying, by the operating system, a load shaper (Figure 2-3, Master Protocol Processing Unit (MPPU) 108; note MPPU 108 performs traffic shaping through the use of credit/grant procedures in the overall system.) of the unique identity (Figure 4; col. 8, lines 28-52; note control information transmitted by PPUs include CardID and bandwidth request information are gathered by MPPU 108);

notifying, by the operating system, the load shaper of the reservation of bandwidth by informing the load shaper (Figure 4; col. 8, lines 28-52; note control information transmitted by PPUs include CardID and bandwidth request information are gathered by MPPU 108) of the number of credits over the operational period reserved for use by the first entity (Figure 10-11; col. 9, lines 19-26; bandwidth request information includes buffer occupancy parameter; col. 6, lines 41-53; buffer occupancy parameter includes counter value based on grants/credits; see Figures 10-11, method utilizing grants/credits; col. 6, lines 29-67; note bandwidth requirement is calculated for each cycle (C).);

resetting, by the load shaper, a counter to the number of credits at the beginning of a time frame (col. 7, lines 43-65; note Bandwidth Distribution Protocol (BWDP) provides credits to PPUs and MPPUs; note credits are reset to a default value if not data traffic is provided for a certain IPE card fro a certain defined Credit Regeneration Duration).

wherein the time frame has a length equal to the operational period (col. 6, lines 28-58; note each cycle C consists of time required to transmit a determined number of bytes; claim 31 shows cycle time have a determined duration);

receiving, by the load shaper, a path use request (Figure 4; col. 8, lines 28-52; note control information transmitted by PPUs include CardID and bandwidth request information are gathered by MPPU 108; see Figures 10-12 regarding receiving requests) from the first entity (col. 9, line 6-18; note bandwidth request was requested by IPE 104), the path use request comprising the unique identity (col. 9, lines 28-37; control information includes the CardID);

if the counter has at least one credit remaining, decrement the counter (Figure 10-11; Grant [n] = Request [n] Avail BW = Avail BW – Total Req; col. 7, line 66 to col. 8, lines 5; note that When the PPU 106 of the IPE card 104 or the MPPU 108 of the line card 102 schedules traffic to a line card 102 or IPE card 104, it is allowed to transmit an extra amount of traffic to a card (draw-down), which must be less than or equal to the Credit for that particular card. In such a case the Credit will be correspondingly decreased (i.e., the counter will be decremented.).).

Hegde shows the use of grants/credits in performing the Bandwidth Distribution Protocol between line cards and IPE cards, Hegde does not specifically show the relationship between actual transmission of a bandwidth request when a counter has credits remaining. Even though, Hegde shows a counter having at least one credit remaining as discussed above, Hegde does not specifically show enqueueing the path use request for transmission on a multiplex communication path (when counter has credit(s) remaining).

However, the above-mentioned claim limitations are well-established in the art as evidenced by Zheng. Zheng shows (abstract) a counter signal is generated to indicate the

beginning of timeslots in a measurement window. The number of timeslots needed to transmit the data packets with a selected data rate is determined. The method further accesses data from at least one table to determine the spacing between timeslots in the measurement window used to request access to a data bus based on the number of timeslots needed to achieve the selected data rate. Further, access to a data bus for the data packets in the buffer is requested based on the data accessed from the table. The method further transmits the packets when access to the bus is granted..

Specifically, Zheng shows enqueueing the path use request for transmission on a multiplex communication path when counter has credit(s) remaining (Figures 3-4; Par. 0029, 0031, 0033; Traffic shaper 400 includes request generator 402 and counter 404. Counter 404 receives a clock signal from bus 406 and provides an input signal to request generator 402. Request generator 402 further provides request signals to bus 406 and receives grant signals from bus 406. When a request is granted, a data packet from buffer 308 is placed on the bus. Once the request is granted, counter 410 is decremented. The request is granted either because no one is sending data, the timeslot is available or the timeslot was granted to this source based on arbitration.).

In view of the above, having the system of Hegde, then given the well-established teaching of Zheng, it would have been obvious to one of ordinary skill in the art to modify the system of Hegde as taught by Zheng, in order to allow an approximation algorithm that takes advantage of the repetitive nature of requests produced by request generators which substantially reduces the size of the memory needed to store a request sequence for a given measurement window of a given size (Par. 0034).

As to claim 9, Hegde shows a computer program product (col. 13, lines 42-61; bandwidth distribution software module) for multiplex communication path access control (Figure 1, bandwidth contention along switch fabric), the computer program product comprising:

computer code for requesting, by a processing unit (Figure 3, Protocol Processing Units (PPUs), an amount of path bandwidth to be reserved (col. 8, lines 6-19 and 28-53; PPUs 106 gather bandwidth request information; note IPE card 104 has a bandwidth request for transmission across switch fabric; see Figure 10-11, start request generation) for use by a first entity (Figure 3, IPE card 104);

computer code for determining, by an operating system (col. 13, lines 42-61; bandwidth distribution software module), whether the amount of path bandwidth is available to be reserved (Figures 10-11, method shows determination if bandwidth is available; available BW > 0; total req. > avail. BW);

computer code for reserving, by the operating system, the amount of path bandwidth for use by the first entity (col. 8, lines 6-19 and 28-53; PPUs 106 gather bandwidth request information; note IPE card 104 has a bandwidth request for transmission across switch fabric) as a number of credits (col. 9, lines 19-26; bandwidth request information includes buffer occupancy parameter; col. 6, lines 41-53; buffer occupancy parameter includes counter value based on grants/credits; see Figures 10-11, method utilizing grants/credits) over an operational period (col. 6, lines 29-67; note bandwidth requirement is calculated for each cycle (C).);

computer code for assigning, by the operating system, a unique identity to the first entity (col. 6, line 30-32; CardID parameter uniquely identifies a line card 102 or IPE card 104);

computer code for notifying, by the operating system, the first entity of the unique identity and the reservation of bandwidth (Figure 4, shows format of BW request information; col. 8, lines 28-52; note control information transmitted by PPUs include CardID and bandwidth request information);

computer code for notifying, by the operating system, a load shaper (Figure 2-3, Master Protocol Processing Unit (MPPU) 108; note MPPU 108 performs traffic shaping through the use of credit/grant procedures in the overall system.) of the unique identity (Figure 4; col. 8, lines 28-52; note control information transmitted by PPUs include CardID and bandwidth request information are gathered by MPPU 108);

computer code for notifying, by the operating system, the load shaper of the reservation of bandwidth by informing the load shaper (Figure 4; col. 8, lines 28-52; note control information transmitted by PPUs include CardID and bandwidth request information are gathered by MPPU 108) of the number of credits over the operational period reserved for use by the first entity (Figure 10-11; col. 9, lines 19-26; bandwidth request information includes buffer occupancy parameter; col. 6, lines 41-53; buffer occupancy parameter includes counter value based on grants/credits; see Figures 10-11, method utilizing grants/credits; col. 6, lines 29-67; note bandwidth requirement is calculated for each cycle (C).);

computer code for resetting, by the load shaper, a counter to the number of credits at the beginning of a time frame (col. 7, lines 43-65; note Bandwidth Distribution Protocol (BWDP) provides credits to PPUs and MPPUs; note credits are reset to a default value if not data traffic is provided for a certain IPE card fro a certain defined Credit Regeneration Duration),

wherein the time frame has a length equal to the operational period (col. 6, lines 28-58; note each cycle C consists of time required to transmit a determined number of bytes; claim 31 shows cycle time have a determined duration)

computer code for receiving, by the load shaper, a path use request (Figure 4; col. 8, lines 28-52; note control information transmitted by PPUs include CardID and bandwidth request information are gathered by MPPU 108; see Figures 10-12 regarding receiving requests) from the first entity (col. 9, line 6-18; note bandwidth request was requested by IPE 104), the path use request comprising the unique identity (col. 9, lines 28-37; control information includes the CardID); and

computer code for, if the counter has at least one credit remaining, decrementing, by the load shaper, the counter (Figure 10-11; Grant [n] = Request [n] Avail BW = Avail BW – Total Req; col. 7, line 66 to col. 8, lines 5; note that When the PPU 106 of the IPE card 104 or the MPPU 108 of the line card 102 schedules traffic to a line card 102 or IPE card 104, it is allowed to transmit an extra amount of traffic to a card (draw-down), which must be less than or equal to the Credit for that particular card. In such a case the Credit will be correspondingly decreased (i.e., the counter will be decremented.).).

Hegde shows the use of grants/credits in performing the Bandwidth Distribution Protocol between line cards and IPE cards, Hegde does not specifically show the relationship between actual transmission of a bandwidth request when a counter has credits remaining. Even though, Hegde shows a counter having at least one credit remaining as discussed above, Hegde does not specifically show enqueueing the path use request for transmission on a multiplex

communication path (when counter has credit(s) remaining) and a tangible computer readable medium.

However, it should be noted that Examiner takes official notice that embodying a computer program/computer program product on a tangible computer-readable medium is well-known in the art at the time of the invention.

In view of the above, having the system of Hegde, then given the well-established teaching of embodying a computer program/computer program product on a tangible computer-readable medium, it would have been obvious to one of ordinary skill in the art at the time of the invention to modify the system of Hegde using the Official Notice, since Hegde expressed (col. 14, lines 27-49) that that the bandwidth distribution of the present invention, including software and hardware implementations, may be configured in alternate ways, and is not limited by the number of component parts and code as described in the preferred embodiments. These software and hardware modifications would merely require minor programming changes and would not require any significant hardware changes.

Still, modified Hegde does not specifically show enqueueing the path use request for transmission on a multiplex communication path (when counter has credit(s) remaining).

However, the above-mentioned claim limitations are well-established in the art as evidenced by Zheng. Zheng shows (abstract) a counter signal is generated to indicate the beginning of timeslots in a measurement window. The number of timeslots needed to transmit the data packets with a selected data rate is determined. The method further accesses data from at least one table to determine the spacing between timeslots in the measurement window used to request access to a data bus based on the number of timeslots needed to achieve the selected data

rate. Further, access to a data bus for the data packets in the buffer is requested based on the data accessed from the table. The method further transmits the packets when access to the bus is granted..

Specifically, Zheng shows enqueueing the path use request for transmission on a multiplex communication path when counter has credit(s) remaining (Figures 3-4; Par. 0029, 0031, 0033; Traffic shaper 400 includes request generator 402 and counter 404. Counter 404 receives a clock signal from bus 406 and provides an input signal to request generator 402. Request generator 402 further provides request signals to bus 406 and receives grant signals from bus 406. When a request is granted, a data packet from buffer 308 is placed on the bus. Once the request is granted, counter 410 is decremented. The request is granted either because no one is sending data, the timeslot is available or the timeslot was granted to this source based on arbitration.).

In view of the above, having the system of modified Hegde, then given the well-established teaching of Zheng, it would have been obvious to one of ordinary skill in the art to modify the system of modified Hegde as taught by Zheng, in order to allow an approximation algorithm that takes advantage of the repetitive nature of requests produced by request generators which substantially reduces the size of the memory needed to store a request sequence for a given measurement window of a given size (Par. 0034).

As to claim 17, modified Hegde shows that if the counter does not have at least one credit remaining, delaying, by the load shaper, the path use request until a next time frame (Zheng: Par. 0033; Counter 410 provides an output signal to comparator 412. Comparator 412 essentially determines whether the value from counter 410 is a low logic value. If not,

comparator 412 produces a request signal for bus 406. This indicates that a request has not been granted yet. Once the request is granted, counter 410 is decremented. The request is granted either because no one is sending data, the timeslot is available or the timeslot was granted to this source based on arbitration.).

As to claim 20, modified Hegde shows the step to determine the path use request is from an entity which path bandwidth has been reserved for (Hegde: Figure 4; col. 8, lines 28-52; note control information transmitted by PPUs include CardID and bandwidth request information are gathered by MPPU 108; see Figures 10-12 regarding receiving requests. Note that the Bandwidth Dsitribution Protocol utilizes the CardID information included in the control information in order to distinguish for which IPE card/line card the actual request corresponds to; Figures 4-5 shows the CardID along with its BW request information.).

As to claims 21 and 24, these claims are rejected using the same reasoning presented in the rejection of claim 17.

11. **Claims 16 and 19** are rejected under 35 U.S.C. 103(a) as being unpatentable over Hegde et al. (US 6,810,031; hereinafter Hegde) in view of Zheng et al. (US 2002/0163886; hereinafter Zheng) in further view of Bly et al. (US 2004/0042399; hereinafter Bly).

As to claim 16, modified Hegde shows the multiplex communication path is a bus (Zheng: Figure 3, Bus 306), and further comprising:

receiving, by the load shaper, a second path use request (Hegde: col. 8, lines 28-44; note that the requests are not limited to a single request from the IPE card 104; Bandwidth Accumulation Procedure is also performed by a plurality of IP cards 104 and a plurality of line

cards 102) from a second entity (Hegde: Figures 1-3; note another IPE card 104 or line card 102 performing the Bandwidth Accumulation Procedure), wherein path bandwidth has not been reserved for use by the second entity (Hegde: Figures 10-11, method shows determination if bandwidth is available; available BW > 0; total req. > avail. BW for each received request); and

enqueuing, by the load shaper, the second path use request for transmission on the multiplex communication path (Zheng: (Figures 3-4; Par. 0029, 0031, 0033; Traffic shaper 400 includes request generator 402 and counter 404. Counter 404 receives a clock signal from bus 406 and provides an input signal to request generator 402. Request generator 402 further provides request signals to bus 406 and receives grant signals from bus 406. When a request is granted, a data packet from buffer 308 is placed on the bus. Once the request is granted, counter 410 is decremented. The request is granted either because no one is sending data, the timeslot is available or the timeslot was granted to this source based on arbitration.).

Even though, modified Hegde shows enqueuing step, as shown above, modified Hegde does not specifically show enqueuing in a best efforts manner.

However, the above-mentioned claim limitations are well-established in the art as evidenced by Bly. Specifically, Bly shows enqueuing in a best efforts manner (Par. 0024; The shaping engine 34 (see FIG. 4) en-queues incoming traffic 36 onto a selected one of the queues 44-47 based, for example, upon look-up information, which classifies the traffic; note classifying also includes handling in best efforts basis.).

In view of the above, having the system of modified Hegde, then given the well-established teaching of Bly, it would have been obvious to one of ordinary skill in the art at the time of the invention to modify the system of modified Hegde, as taught by Bly, in order to invention to

modify the system of Chapman as taught by Bly in order to provide the ability to shape traffic in a cost-effective manner (Par. 0048).

As to claim 19, this claim is rejected using the same reasoning presented in the rejection of claim 16.

12. **Claims 25-27** are rejected under 35 U.S.C. 103(a) as being unpatentable over Hegde et al. (US 6,810,031; hereinafter Hegde) in view of Zheng et al. (US 2002/0163886; hereinafter Zheng) in further view of DeMoney (US 6,721,789; hereinafter DeMoney).

As to claim 25, modified Hegde shows the multiplex communication path is a bus (Zheng: Figure 3, bus 306);

the first entity is a computer application processed by the processing unit (Hegde: col. 13, line 42 to col. 14, line 11; note bandwidth distribution software module on MPPUs of the IPE cards 104); and

the path use request (col. 8, lines 6-19 and 28-53; note IPE card 104 has a bandwidth request for transmission across switch fabric; see Figure 10-11, start request generation) comprises a request to transmit a data packet (col. 3, lines 22-24; note transmission of data packets through a switch fabric is provided) to a device in the same system as the first entity (Figure 1, shows the system where the Bandwidth Distribution Protocol (BWDP) is utilized to transmit packets from input ports to output ports (i.e. line cards) through the use of bandwidth requests and grant generation).

Even though, modified Hegde shows the above-mentioned features, modified Hegde does not show the first entity is in a computer system and the device in the same computer system as the first entity

However, the above-mentioned claim limitations are well-established in the art as evidenced by DeMoney. DeMoney shows (abstract; Figure 2-3) a storage system that also employs bandwidth allocation to different devices belonging to the system. The bandwidth allocator may be configured to allocate bandwidth of the storage system between the guaranteed rate queue and the non-rate-guaranteed queue according to a predetermined ratio. Requests may be ordered in the non-rate guaranteed queue according to a priority. The system may also include a buffer ring for each multimedia data stream from one of the rate guaranteed requestors.

Specifically, DeMoney shows the first entity is in a computer system and the device in the same computer system as the first entity (Figure 2-3; col. 9, line 14 to col. 10, line 23; note the computer system includes the plurality of storage systems and the clients/requestors).

In view of the above, having the system of modified Hegde, then given the well-established teaching of DeMoney, it would have been obvious to one of ordinary skill in the art at the time of the invention to modify the system of modified Hegde as taught by DeMoney, in order to guarantee performance on an arbitrary mix continuous multimedia streams including reads, writes, varying bit rates, single files, and multiple files and to provide efficient high utilization of disk bandwidth is also desirable (col. 3, line 65 to col. 4, lines 4).

As to claims 26 and 27, these claims are rejected using the same reasoning provided in the rejection of claim 25.

Conclusion

13. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

14. Any inquiry concerning this communication or earlier communications from the examiner should be directed to REDENTOR M. PASIA whose telephone number is (571)272-9745. The examiner can normally be reached on M-F 7:30am to 4:00pm EST.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Aung Moe can be reached on (571)272-7314. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

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